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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,392	12/09/2003	Robert D. Galli	E001 P00929-US1	4646
3017	7590	11/03/2004	EXAMINER	
BARLOW, JOSEPHS & HOLMES, LTD. 101 DYER STREET 5TH FLOOR PROVIDENCE, RI 02903			HAN, JASON	
			ART UNIT	PAPER NUMBER
			2875	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/731,392	Applicant(s) GALLI, ROBERT D.	
	Examiner Jason M Han	Art Unit 2875	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☒ Claim(s) 1 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. This application repeats a substantial portion of prior Application No. 10/659575, filed September 10, 2003, which is a continuation-in-part of Application No. 10/315336, filed December 10, 2002, which claims priority from provisional patent application No. 60/338893, filed December 10, 2001, and adds and claims additional disclosure not presented in the prior application. Since this application names an inventor or inventors named in the prior application, it may constitute a continuation-in-part of the prior application. Should applicant desire to obtain the benefit of the filing date of the prior application, attention is directed to 35 U.S.C. 120 and 37 CFR 1.78.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "flexible contact strip (32) and interior die (14) [Page 13, Figure 4]". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

4. The disclosure is objected to because of the following informalities:

a. Page 19, First Paragraph: slot "206" should read "306"; also, please make sure "circular hole 304" is actually pointing to the hole in the drawing.

Appropriate correction is required.

Claim Objections

5. Claim 1 is objected to because of the following informalities: It is unclear what the applicant is claiming with respect to the "interior" die. Interior to what? Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. Claim 6 recites the limitation "light source" in Line 6 of the Claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Carey et al. (U.S. Patent 6274924). It should be noted that the following rejection has been based on a broad interpretation [MPEP 2111] of the claim.

Carey discloses a surface mountable LED package wherein the light emitting diode [Figure 2: (16)] has a front luminescent portion [Figure 2: (20)]; a mounting base [Figure 2: (12)] having a heat transfer plate [Figure 2: (18)] located on a rear surface thereof and a first and second contact lead [Column 2, Lines 28-31] extending from the sides thereof; an interior die [Figure 2: (10)] having a first and a second end opposite said first end whereby the die is electrically conductive and in thermal communication with the heat transfer plate [Column 2, Lines 42-58]; and a lens [Figure 2: (20)] for directing light output from the light emitting diode forwardly along an optical axis [Column 2, Lines 31-36].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochstein et al. (U.S. Patent 6582100) in view of Petroski (U.S. Patent 6481874).

10. With regards to Claim 1, Hochstein discloses an LED mounting system wherein the LED has a front luminescent portion [Figures 1-2: (39)]; a mounting base [Figures 1-2: (20)] having a heat transfer plate [Figures 1-2: (52, 54)] located on a rear surface thereof and a first and second contact leads [Figures 1-2: (22, 24)] extending from the sides thereof; a die [Figures 1-2: (10)] having a first and a second end opposite said first end [Column 3, Lines 33-36] whereby the die is electrically and thermally conductive and in thermal communication with the heat transfer plate [Figures 1-2; Column 3, Lines 20-24]; and a lens [Figures 1-2: (39)] for directing light output from the light emitting diode.

Hochstein does not teach the die being in the interior of a housing [please note claim objection above].

Petroski discloses a heat dissipation system for high power LED lighting systems wherein an LED [Figure 1: (12)] is mounted on a die/die support [Figure 1: (14, 16)] disposed within an outer housing [Figure 1: (22)].

It is obvious that the teaching of Hochstein would incorporate the LED being used within a housing to provide protection, aesthetic appeal, etc. It is also obvious that one could incorporate the LED mount of Hochstein onto the die support of Petroski to further improve heat dissipation and overall illumination performance. Such a configuration is commonly held in the art whereby a surface mountable LED package is connected to an external heat sink to prevent thermal build-up within the package.

11. With regards to Claim 2, Hochstein teaches the die including an aperture [Figures 1-2: (42)] extending from a first end to a second end thereof. Hochstein further teaches the first contact lead in electrical communication with the die and the second contact lead extending through the aperture [Figures 1-2: (36, 44)]. The examiner makes note of applicant's limitation in light of the specification, but has broadly interpreted the claims [MPEP 2111] and considers the reference functionally equivalent in providing efficient heat transfer and electrical communication via the die. In addition, Hochstein teaches, "It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column3, Lines 46-49]," which corroborates functional equivalence and whereby the structure is a matter of design preference.

12. With regards to Claim 3, Hochstein teaches a circuit board/insulating layer [Figures 1-2: (12)] adjacent to the die and having circuit traces [Figures 1-2: (14)] in electrical communication with the contact leads [Figures 1-2: (22)] of the LED [Column 3, Lines 41-44].

13. With regards to Claim 4, Hochstein teaches a circuit board/insulating layer as cited above, however, does not specifically teach the circuit traces in electrical communication with control circuitry.

To the applicant's admission, "control circuitry 40 may be mounted onto the flexible circuit strip 32 and housed within the channel 30 in the die 14. The control circuitry includes an LED driver circuit as is well known in the art [Page 15, last couple sentences]."

-It would have been obvious to modify the circuit traces of Hochstein to be in electrical communication with control circuitry so as to provide an LED driver circuit.

14. With regard to Claims 5 and 7, Hochstein teaches an LED including a lens in communication with a die as cited above in Claim 1. Hochstein further teaches, "The assembly includes a plurality of light emitting diodes 20 and each LED 20 has electrical leads 22 for electrical contact with the traces 14 for powering the respective LEDs 20.

In the preferred mode, the electrical leads 22 extend laterally or horizontally in opposite directions from opposite extremities of the LED 20 and overlie the traces 14. It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column 3, Lines 41-49; underlines added for emphasis]."

Hochstein does not specifically teach the LED assembly having a tubular outer wall as an exterior enclosure, wherein the outer wall forms a cavity for receiving and maintaining the die, LED, and lens in an assembled relation.

Petroski discloses a heat dissipation system for high power LED lighting systems having an LED [Figure 1: (12)] mounted on a die/die support [Figure 1: (14, 16)] disposed within a cavity defined by a tubular outer wall [Figure 1: (22)]. Petroski also teaches a lens [Figure 1: (32)] that is in an assembled relation with the aforementioned components.

It is obvious that the teaching of Hochstein would incorporate the LED in an assembled relation with a die, lens, and housing to provide a suitable illumination device for a user/consumer. It is also obvious that one could incorporate the LED mount of

Hochstein onto the die support of Petroski to further improve heat dissipation and overall illumination performance.

15. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hochstein et al. (U.S. Patent 6582100) in view of Petroski (U.S. Patent 6481874) as applied to Claim 1 above, and further in view of Marshall et al. (U.S. Patent 6547423).

Hochstein in view of Petroski teach an LED assembly having a lens as cited above.

Neither Hochstein nor Petroski specifically teach the lens including a total internal reflection collector portion where there is a rear surface, an outer side wall, a cavity extending into the collector portion from the rear surface, whereby the cavity has an inner side wall and a front wall and an LED disposed therein.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1: where the LED is disposed], an outer side wall [Figure 1A: (7)], and a cavity, defined by an inner side wall [Figure 1A: (9)] and a front wall [Figure 1A: (8)], having an LED disposed within.

It would have been obvious to modify the LED mount of Hochstein onto the die support of Petroski to further incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

16. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochstein et al. (U.S. Patent 6582100) in view of Petroski (U.S. Patent 6481874), and further in view of Marshall et al. (U.S. Patent 6547423).

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17. With regards to Claim 8, Hochstein discloses an LED mounting system wherein the LED has a front luminescent portion [Figures 1-2: (39)]; a mounting base [Figures 1-2: (20)] having a heat transfer plate [Figures 1-2: (52, 54)] located on a rear surface thereof and a first and second contact leads [Figures 1-2: (22, 24)] extending from the sides thereof; a die [Figures 1-2: (10)] having a first and a second end opposite said first end [Column 3, Lines 33-36] whereby the die is electrically conductive and in thermal communication with the heat transfer plate [Figures 1-2; Column 3, Lines 20-24]; and a lens [Figures 1-2: (39)] for directing light output from the light emitting diode.

Hochstein teaches the die including an aperture [Figures 1-2: (42)] extending from a first end to a second end thereof. Hochstein further teaches the first contact lead in electrical communication with the die and the second contact lead extending through the aperture [Figures 1-2: (36, 44)]. The examiner makes note of applicant's limitation in light of the specification, but has broadly interpreted the claims [MPEP 2111] and considers the reference functionally equivalent in providing efficient heat transfer and electrical communication via the die. In addition, Hochstein teaches, "It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column 3, Lines 46-49]," which corroborates functional equivalence and whereby the structure is a matter of design preference.

Hochstein does not specifically teach the die being in an exterior enclosure defined by a tubular outer wall, wherein the outer wall forms a cavity for receiving and maintaining the die, LED, and lens in an assembled relation. In addition, Hochstein

does not teach the lens including a total internal reflection collector portion where there is a recess extending into the collector portion so as to receive the LED.

Petroski discloses a heat dissipation system for high power LED lighting systems having an LED [Figure 1: (12)] mounted on a die/die support [Figure 1: (14, 16)] disposed within a cavity defined by a tubular outer wall [Figure 1: (22)]. Petroski also teaches a lens [Figure 1: (32)] that is in an assembled relation with the aforementioned components.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1: where the LED is disposed], an outer side wall [Figure 1A: (7)], and a cavity, defined by an inner side wall [Figure 1A: (9)] and a front wall [Figure 1A: (8)], having an LED disposed within.

It is obvious that the teaching of Hochstein would incorporate the LED being used within a housing to provide protection, aesthetic appeal, etc. It is also obvious that one could incorporate the LED mount of Hochstein onto the die support of Petroski to further improve heat dissipation and overall illumination performance. Such a configuration is commonly held in the art whereby a surface mountable LED package is connected to an external heat sink to prevent thermal build-up within the package.

Lastly, it would have been advantageous and obvious to modify the LED mount of Hochstein onto the die support of Petroski to further incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

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18. With regard to Claims 9-10, Hochstein teaches a circuit board/insulating layer [Figures 1-2: (12)] adjacent to the die and having circuit traces [Figures 1-2: (14)] in electrical communication with the contact leads [Figures 1-2: (22)] of the LED [Column 3, Lines 41-44].

19. With regards to Claim 11, Hochstein teaches a circuit board/insulating layer as cited above, however, does not specifically teach the circuit traces in electrical communication with control circuitry.

To the applicant's admission, "control circuitry 40 may be mounted onto the flexible circuit strip 32 and housed within the channel 30 in the die 14. The control circuitry includes an LED driver circuit as is well known in the art [Page 15, last couple sentences]."

It would have been obvious to modify the circuit traces of Hochstein to be in electrical communication with control circuitry so as to provide an LED driver circuit.

20. With regards to Claim 12, Hochstein teaches, "The assembly includes a plurality of light emitting diodes 20 and each LED 20 has electrical leads 22 for electrical contact with the traces 14 for powering the respective LEDs 20. In the preferred mode, the electrical leads 22 extend laterally or horizontally in opposite directions from opposite extremities of the LED 20 and overlie the traces 14. It is also possible, to use a single lead LED where the heat sink 54 is one of the electrical connections while the other lead constitutes the second electrical connection to a trace [Column 3, Lines 41-49; underlines added for emphasis]."

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21. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hochstein et al. (U.S. Patent 6582100) in view of Marshall et al. (U.S. Patent 6547423).

22. With regard to Claims 13 and 15, Hochstein discloses an LED mounting system wherein the LED has a front luminescent portion [Figures 1-2: (39)]; a mounting base [Figures 1-2: (20)] having a heat transfer plate [Figures 1-2: (54)] located on a rear surface thereof and a first and second contact leads [Figures 1-2: (22, 24)] extending from the sides thereof; a die [Figures 1-2: (10)] having a recess to receive the mounting base [Figures 1-2: (40)], a rear surface [Column 3, Lines 33-36], and whereby the die is in thermal communication with the heat transfer plate and a spreader plate [Figures 1-2: (52)] that conducts heat from the LED to the rear surface of the die; and a lens [Figures 1-2: (39)] for directing light output from the light emitting diode.

Hochstein teaches the die including an aperture [Figures 1-2: (42)] extending from a first end to a second end thereof. The examiner makes note of applicant's limitations in light of the specification, but has broadly interpreted the claims [MPEP 2111] and considers the reference functionally equivalent in providing efficient heat transfer via the die. Also, with respect to the luminescent portion of the LED extending through the aperture, it is commonly held and seen in the art (i.e. vehicle lamps) whereby an LED is fitted into an aperture of a reflector and further connected to a socket with heat dissipating means.

Hochstein does not specifically teach the lens including a total internal reflection collector portion where there is a recess defined by a rear surface, an outer side wall,

and a cavity extending into the collector portion from the rear surface, whereby the cavity has an inner side wall and a front wall and an LED disposed therein.

Marshall discloses an LED collimation optics with improved performance and reduced size. Marshall teaches the collimator [Figure 1A: (20)] having a rear surface [Figure 1: where the LED is disposed], an outer side wall [Figure 1A: (7)], and a cavity, defined by an inner side wall [Figure 1A: (9)] and a front wall [Figure 1A: (8)], having an LED disposed within.

It would have been advantageous and obvious to modify the LED mount of Hochstein to incorporate the collimator lens of Marshall in order to provide LED collimation optics in modifying the illumination with desired optical effect(s).

23. With regards to Claim 14, Hochstein teaches a circuit board/insulating layer [Figures 1-2: (12)] proximately adjacent to the spreader plate and having circuit traces [Figures 1-2: (14)] in electrical communication with the contact leads [Figures 1-2: (22)] of the LED [Column 3, Lines 41-44].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art pertinent to the current application:

U.S. Patent 4471414 to Savage, Jr.;

U.S. Patent 4577263 to Maglica;

U.S. Patent 4600977 to Barlian et al.;

U.S. Patent 4733337 to Bieberstein;

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U.S. Patent 4780799 to Groh;	U.S. Patent 4967330 to Bell et al.;
U.S. Patent 5029335 to Fisher et al.;	U.S. Patent 5087212 to Hanami;
U.S. Patent 5368503 to Savage, Jr.;	U.S. Patent 5528474 to Roney et al.;
U.S. Patent 5695275 to Markiewicz et al.;	U.S. Patent 5782555 to Hochstein;
U.S. Patent 5785418 to Hochstein;	U.S. Patent 5857767 to Hochstein;
U.S. Patent 6019493 to Kuo et al.;	U.S. Patent 6045240 to Hochstein;
U.S. Patent 6161910 to Reisenauer et al.;	U.S. Patent 6371636 to Wesson;
U.S. Patent 6428189 to Hochstein;	U.S. Patent 6441943 to Roberts et al.;
U.S. Patent 6452217 to Wojnarowski et al.;	U.S. Patent 6474835 to Lin;
U.S. Patent 6517218 to Hochstein;	U.S. Patent 6541800 to Barnett et al.;
U.S. Patent 6737811 to Zhang et al.;	U.S. Patent 6799864 to Bohler et al.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Han whose telephone number is (571) 272-2207. The examiner can normally be reached on 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (571) 272-2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMH



JOHN ANTHONY WARD
PRIMARY EXAMINER